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NEW BAUMÉ SCALE FOR SUGAR SOLUTIONS

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In laboratory and refinery measurements on sugar solutions it is customary to determine the percentage of sugar either by means of a picnometer or a hydrometer. In case the picnometer is used it is customary to obtain the specific gravity at some specified temperature in terms of water at the same temperature as unity, and then by means of a conversion table to find the corresponding percentage of sugar. In case the hydrometer is used it is customary either to read the percentage of sugar direct or to read the degrees Baumé and then, by an appropriate conversion table, to determine the corresponding percentage of sugar. In certain cases the Baumé degrees are used without reference to any other scale, but in general a definite relation between degrees Baumé and degrees Brix or specific gravity must be agreed upon before the Baumé readings are of any great value. This relation is arrived at by determining experimentally the specific gravity corresponding to various known percentages of sugar and then calculating the degrees Baumé corresponding to these specific gravities by assuming a constant multiplier or "modulus" on which the Baumé scale is based. Having chosen the modulus, the working out of the table relating specific gravity and degrees Baumé is purely arithmetical, the degrees Baumé corresponding to a series of specific gravities being calculated by means of the equation

$$d = m - \frac{m}{s},$$

in which d = degrees Baumé, m = modulus, and s = specific gravity. The specific gravities must all be reduced to the same temperature and it is desirable also that they be expressed in terms of water at the same temperature, in order that zero per cent sugar may have a specific gravity of unity. This will give also a value of zero degrees Baumé corresponding to zero per cent sugar, or zero degrees Brix.¹

Many different Baumé scales have been proposed and used in the past, and at the present time there are still in use in the United States three different scales for liquids heavier than water. One of these, the American standard Baumé scale, is based on the modulus 145 and on the temperature 60° F, and is extensively used in the acid industry and in other similar lines with the exception of the sugar industry. (See Circular No. 59, Bureau of Standards.) The other two scales, the "old" or "Holland" scale and the "new" or "Gerlach" scale, are used in sugar work. The Gerlach scale, with the modulus 146.78 and the temperature 17.5° C seems to be most often employed. In the "Methods of analysis" of the Association of Official Agricultural Chemists both tables are given, the more extensive of the two being the "old" or "Holland" scale based on the modulus 144.

The new table lies between the so-called "old" and "new" tables, being in almost perfect agreement with the "old" up to 25 per cent sugar and from that point on about 0.1° Baumé higher than the "old." A brief comparison between the three tables is given in Table 1.

¹ Hydrometers are not certified by the Bureau of Standards on the basis of the original "Brix" or "Balling" scale. Both "Brix" and "Balling" are interpreted by the Bureau as meaning percentage of pure sucrose of weight.

TABLE 1.—Comparison of Baumé Scales

Per cent sucrose or degrees Brix	Corresponding degrees Baumé		
	"New" scale (modulus 146.78)	"Old" scale (modulus 144)	B. S. scale (modulus 145)
0	0.0	0.0	0.00
5	2.8	2.8	2.79
10	5.7	5.6	5.57
15	8.5	8.3	8.34
20	11.3	11.1	11.10
25	14.1	13.8	13.84
30	16.8	16.5	16.57
35	19.6	19.2	19.28
40	22.3	21.9	21.97
45	25.0	24.6	24.63
50	27.7	27.2	27.28
55	30.4	29.8	29.90
60	33.0	32.4	32.49
65	35.6	34.9	35.04
70	38.1	37.4	37.56
75	40.6	39.9	40.03
80	43.1	42.3	42.47
85	45.5	44.7	44.86
90	47.9	47.0	47.20
95	50.3	49.3	49.49
100	-----	-----	51.73

The Bureau of Standards has always held¹ that the relation between specific gravity and degrees Baumé, for liquids heavier than water, should be that based on the modulus 145. This modulus is now in universal use in the United States except in the sugar industry. It has been adopted by the Manufacturing Chemists Association, by the Bureau of Standards, and by all American manufacturers of Baumé hydrometers.

The American standard Baumé scale, as heretofore used, is based on specific gravities at 60°/60° F instead of 20°/20° C, but this change should not be considered serious, since the same numerical relation between specific gravity and degrees Baumé will still hold; that is, the degrees Baumé corresponding to a given specific gravity will still be the same as before. The only difference is that the specific gravity 20°/20° C corresponding to any given percentage of sugar is slightly different from what it would be at 60°/60° F.

The relation between specific gravity and degrees Baumé is as follows:

$$\text{Degrees Baumé} = 145 - \frac{145}{\text{Specific gravity}}$$

¹See Bureau of Standards Circulars Nos. 16, 19, and 59.

The Baumé scale here presented has three features which should commend it for use in sugar work.

1. It is based upon the specific gravity values of Plato² which are considered the most reliable of any available.

2. It is based on 20° C, the most convenient and widely accepted temperature for sugar work.

3. It is based on the modulus 145, which has already been adopted by the Manufacturing Chemists Association of the United States, by the Bureau of Standards, and by all American manufacturers of hydrometers.

TABLE 2.—Degrees Brix, Specific Gravity, and Degrees Baumé of Sugar Solutions

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
0.0	0.99823	1.00000	0.00	4.5	1.01586	1.01766	2.52
0.1	0.99862	1.00039	0.06	4.6	1.01626	1.01806	2.57
0.2	0.99901	1.00078	0.11	4.7	1.01666	1.01846	2.63
0.3	0.99940	1.00117	0.17	4.8	1.01706	1.01886	2.68
0.4	0.99979	1.00155	0.22	4.9	1.01746	1.01926	2.74
0.5	1.00017	1.00194	0.28	5.0	1.01785	1.01965	2.79
0.6	1.00056	1.00233	0.34	5.1	1.01825	1.02005	2.85
0.7	1.00095	1.00272	0.39	5.2	1.01865	1.02045	2.91
0.8	1.00134	1.00311	0.45	5.3	1.01905	1.02085	2.96
0.9	1.00173	1.00350	0.51	5.4	1.01945	1.02125	3.02
1.0	1.00212	1.00389	0.56	5.5	1.01985	1.02165	3.07
1.1	1.00251	1.00428	0.62	5.6	1.02025	1.02206	3.13
1.2	1.00290	1.00467	0.67	5.7	1.02065	1.02246	3.18
1.3	1.00329	1.00506	0.73	5.8	1.02105	1.02286	3.24
1.4	1.00368	1.00545	0.79	5.9	1.02145	1.02326	3.30
1.5	1.00406	1.00584	0.84	6.0	1.02186	1.02366	3.35
1.6	1.00445	1.00623	0.90	6.1	1.02226	1.02407	3.41
1.7	1.00484	1.00662	0.95	6.2	1.02266	1.02447	3.46
1.8	1.00523	1.00701	1.01	6.3	1.02306	1.02487	3.52
1.9	1.00562	1.00740	1.07	6.4	1.02346	1.02527	3.57
2.0	1.00602	1.00779	1.12	6.5	1.02387	1.02568	3.63
2.1	1.00641	1.00818	1.18	6.6	1.02427	1.02608	3.69
2.2	1.00680	1.00858	1.23	6.7	1.02467	1.02648	3.74
2.3	1.00719	1.00897	1.29	6.8	1.02508	1.02689	3.80
2.4	1.00758	1.00936	1.34	6.9	1.02548	1.02729	3.85
2.5	1.00797	1.00976	1.40	7.0	1.02588	1.02770	3.91
2.6	1.00836	1.01015	1.46	7.1	1.02629	1.02810	3.96
2.7	1.00876	1.01054	1.51	7.2	1.02669	1.02851	4.02
2.8	1.00915	1.01093	1.57	7.3	1.02710	1.02892	4.08
2.9	1.00954	1.01133	1.62	7.4	1.02750	1.02932	4.13
3.0	1.00993	1.01172	1.68	7.5	1.02791	1.02973	4.19
3.1	1.01033	1.01211	1.74	7.6	1.02832	1.03013	4.24
3.2	1.01072	1.01251	1.79	7.7	1.02872	1.03054	4.30
3.3	1.01112	1.01290	1.85	7.8	1.02913	1.03095	4.35
3.4	1.01151	1.01330	1.90	7.9	1.02954	1.03136	4.41
3.5	1.01190	1.01369	1.96	8.0	1.02994	1.03176	4.46
3.6	1.01230	1.01409	2.02	8.1	1.03035	1.03217	4.52
3.7	1.01269	1.01448	2.07	8.2	1.03076	1.03258	4.58
3.8	1.01309	1.01488	2.13	8.3	1.03116	1.03299	4.63
3.9	1.01348	1.01528	2.18	8.4	1.03157	1.03340	4.69
4.0	1.01388	1.01567	2.24	8.5	1.03198	1.03381	4.74
4.1	1.01428	1.01607	2.29	8.6	1.03239	1.03422	4.80
4.2	1.01467	1.01647	2.35	8.7	1.03280	1.03463	4.85
4.3	1.01507	1.01687	2.40	8.8	1.03321	1.03504	4.91
4.4	1.01547	1.01726	2.46	8.9	1.03362	1.03545	4.96

² Dr. F. Plato, *Wiss. Abh. Der Kaiserlichen Normal-Eichungs-Kommission*, 2, p. 153: 1900.

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
9.0	1.03403	1.03586	5.02	15.5	1.06131	1.06319	8.62
9.1	1.03444	1.03627	5.07	15.6	1.06174	1.06362	8.67
9.2	1.03485	1.03668	5.13	15.7	1.06217	1.06405	8.73
9.3	1.03526	1.03709	5.19	15.8	1.06260	1.06448	8.78
9.4	1.03567	1.03750	5.24	15.9	1.06303	1.06491	8.84
9.5	1.03608	1.03792	5.30	16.0	1.06346	1.06534	8.89
9.6	1.03649	1.03833	5.35	16.1	1.06389	1.06577	8.95
9.7	1.03691	1.03874	5.41	16.2	1.06432	1.06621	9.00
9.8	1.03732	1.03915	5.46	16.3	1.06476	1.06664	9.06
9.9	1.03773	1.03957	5.52	16.4	1.06519	1.06707	9.11
10.0	1.03814	1.03998	5.57	16.5	1.06562	1.06751	9.17
10.1	1.03856	1.04039	5.63	16.6	1.06605	1.06794	9.22
10.2	1.03897	1.04081	5.68	16.7	1.06649	1.06837	9.28
10.3	1.03938	1.04122	5.74	16.8	1.06692	1.06881	9.33
10.4	1.03980	1.04164	5.80	16.9	1.06736	1.06924	9.39
10.5	1.04021	1.04205	5.85	17.0	1.06779	1.06968	9.45
10.6	1.04063	1.04247	5.91	17.1	1.06822	1.07011	9.50
10.7	1.04104	1.04288	5.96	17.2	1.06866	1.07055	9.56
10.8	1.04146	1.04330	6.02	17.3	1.06909	1.07098	9.61
10.9	1.04187	1.04371	6.07	17.4	1.06953	1.07142	9.67
11.0	1.04229	1.04413	6.13	17.5	1.06996	1.07186	9.72
11.1	1.04270	1.04455	6.18	17.6	1.07040	1.07229	9.78
11.2	1.04312	1.04497	6.24	17.7	1.07084	1.07273	9.83
11.3	1.04354	1.04538	6.30	17.8	1.07127	1.07317	9.89
11.4	1.04395	1.04580	6.35	17.9	1.07171	1.07361	9.94
11.5	1.04437	1.04622	6.41	18.0	1.07215	1.07404	10.00
11.6	1.04479	1.04664	6.46	18.1	1.07258	1.07448	10.05
11.7	1.04521	1.04706	6.52	18.2	1.07302	1.07492	10.11
11.8	1.04562	1.04747	6.57	18.3	1.07346	1.07536	10.16
11.9	1.04604	1.04789	6.63	18.4	1.07390	1.07580	10.22
12.0	1.04646	1.04831	6.68	18.5	1.07434	1.07624	10.27
12.1	1.04688	1.04873	6.74	18.6	1.07478	1.07668	10.33
12.2	1.04730	1.04915	6.79	18.7	1.07522	1.07712	10.38
12.3	1.04772	1.04957	6.85	18.8	1.07566	1.07756	10.44
12.4	1.04814	1.04999	6.90	18.9	1.07610	1.07800	10.49
12.5	1.04856	1.05041	6.96	19.0	1.07654	1.07844	10.55
12.6	1.04898	1.05084	7.02	19.1	1.07698	1.07888	10.60
12.7	1.04940	1.05126	7.07	19.2	1.07742	1.07932	10.66
12.8	1.04982	1.05168	7.13	19.3	1.07786	1.07977	10.71
12.9	1.05024	1.05210	7.18	19.4	1.07830	1.08021	10.77
13.0	1.05066	1.05252	7.24	19.5	1.07874	1.08065	10.82
13.1	1.05109	1.05295	7.29	19.6	1.07919	1.08110	10.88
13.2	1.05151	1.05337	7.35	19.7	1.07963	1.08154	10.93
13.3	1.05193	1.05379	7.40	19.8	1.08007	1.08198	10.99
13.4	1.05236	1.05422	7.46	19.9	1.08052	1.08243	11.04
13.5	1.05278	1.05464	7.51	20.0	1.08096	1.08287	11.10
13.6	1.05320	1.05506	7.57	20.1	1.08140	1.08332	11.15
13.7	1.05363	1.05549	7.62	20.2	1.08185	1.08376	11.21
13.8	1.05405	1.05591	7.68	20.3	1.08229	1.08421	11.26
13.9	1.05448	1.05634	7.73	20.4	1.08274	1.08465	11.32
14.0	1.05490	1.05677	7.79	20.5	1.08318	1.08510	11.37
14.1	1.05532	1.05719	7.84	20.6	1.08363	1.08554	11.43
14.2	1.05575	1.05762	7.90	20.7	1.08407	1.08599	11.48
14.3	1.05618	1.05804	7.96	20.8	1.08452	1.08644	11.54
14.4	1.05660	1.05847	8.01	20.9	1.08497	1.08689	11.59
14.5	1.05703	1.05890	8.07	21.0	1.08541	1.08733	11.65
14.6	1.05746	1.05933	8.12	21.1	1.08586	1.08778	11.70
14.7	1.05788	1.05975	8.18	21.2	1.08631	1.08823	11.76
14.8	1.05831	1.06018	8.23	21.3	1.08676	1.08868	11.81
14.9	1.05874	1.06061	8.29	21.4	1.08720	1.08913	11.87
15.0	1.05916	1.06104	8.34	21.5	1.08765	1.08958	11.92
15.1	1.05959	1.06147	8.40	21.6	1.08810	1.09003	11.98
15.2	1.06002	1.06190	8.45	21.7	1.08855	1.09048	12.03
15.3	1.06045	1.06233	8.51	21.8	1.08900	1.09093	12.09
15.4	1.06088	1.06276	8.56	21.9	1.08945	1.09138	12.14

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
22.0	1.08990	1.09183	12.20	28.5	1.11987	1.12185	15.75
22.1	1.09035	1.09228	12.25	28.6	1.12034	1.12232	15.80
22.2	1.09080	1.09273	12.31	28.7	1.12081	1.12280	15.86
22.3	1.09125	1.09318	12.36	28.8	1.12128	1.12327	15.91
22.4	1.09170	1.09364	12.42	28.9	1.12176	1.12374	15.97
22.5	1.09216	1.09409	12.47	29.0	1.12223	1.12422	16.02
22.6	1.09261	1.09454	12.52	29.1	1.12270	1.12469	16.08
22.7	1.09306	1.09499	12.58	29.2	1.12318	1.12517	16.13
22.8	1.09351	1.09545	12.63	29.3	1.12365	1.12564	16.18
22.9	1.09397	1.09590	12.69	29.4	1.12413	1.12612	16.24
23.0	1.09442	1.09636	12.74	29.5	1.12460	1.12659	16.29
23.1	1.09487	1.09681	12.80	29.6	1.12508	1.12707	16.35
23.2	1.09533	1.09727	12.85	29.7	1.12556	1.12755	16.40
23.3	1.09578	1.09772	12.91	29.8	1.12603	1.12802	16.46
23.4	1.09624	1.09818	12.96	29.9	1.12651	1.12850	16.51
23.5	1.09669	1.09863	13.02	30.0	1.12698	1.12898	16.57
23.6	1.09715	1.09909	13.07	30.1	1.12746	1.12946	16.62
23.7	1.09760	1.09954	13.13	30.2	1.12794	1.12993	16.67
23.8	1.09806	1.10000	13.18	30.3	1.12842	1.13041	16.73
23.9	1.09851	1.10046	13.24	30.4	1.12890	1.13089	16.78
24.0	1.09897	1.10092	13.29	30.5	1.12937	1.13137	16.84
24.1	1.09943	1.10137	13.35	30.6	1.12985	1.13185	16.89
24.2	1.09989	1.10183	13.40	30.7	1.13033	1.13233	16.95
24.3	1.10034	1.10229	13.46	30.8	1.13081	1.13281	17.00
24.4	1.10080	1.10275	13.51	30.9	1.13129	1.13329	17.05
24.5	1.10126	1.10321	13.57	31.0	1.13177	1.13378	17.11
24.6	1.10172	1.10367	13.62	31.1	1.13225	1.13426	17.16
24.7	1.10218	1.10413	13.67	31.2	1.13274	1.13474	17.22
24.8	1.10264	1.10459	13.73	31.3	1.13322	1.13522	17.27
24.9	1.10310	1.10505	13.78	31.4	1.13370	1.13570	17.33
25.0	1.10356	1.10551	13.84	31.5	1.13418	1.13619	17.38
25.1	1.10402	1.10597	13.89	31.6	1.13466	1.13667	17.43
25.2	1.10448	1.10643	13.95	31.7	1.13515	1.13715	17.49
25.3	1.10494	1.10689	14.00	31.8	1.13563	1.13764	17.54
25.4	1.10540	1.10736	14.06	31.9	1.13611	1.13812	17.60
25.5	1.10586	1.10782	14.11	32.0	1.13660	1.13861	17.65
25.6	1.10632	1.10828	14.17	32.1	1.13708	1.13909	17.70
25.7	1.10679	1.10874	14.22	32.2	1.13756	1.13958	17.76
25.8	1.10725	1.10921	14.28	32.3	1.13805	1.14006	17.81
25.9	1.10771	1.10967	14.33	32.4	1.13853	1.14055	17.87
26.0	1.10818	1.11014	14.39	32.5	1.13902	1.14103	17.92
26.1	1.10864	1.11060	14.44	32.6	1.13951	1.14152	17.98
26.2	1.10910	1.11106	14.49	32.7	1.13999	1.14201	18.03
26.3	1.10957	1.11153	14.55	32.8	1.14048	1.14250	18.08
26.4	1.11003	1.11200	14.60	32.9	1.14097	1.14298	18.14
26.5	1.11050	1.11246	14.66	33.0	1.14145	1.14347	18.19
26.6	1.11096	1.11293	14.71	33.1	1.14194	1.14396	18.25
26.7	1.11143	1.11339	14.77	33.2	1.14243	1.14445	18.30
26.8	1.11190	1.11386	14.82	33.3	1.14292	1.14494	18.36
26.9	1.11236	1.11433	14.88	33.4	1.14340	1.14543	18.41
27.0	1.11283	1.11480	14.93	33.5	1.14389	1.14592	18.46
27.1	1.11330	1.11526	14.99	33.6	1.14438	1.14641	18.52
27.2	1.11376	1.11573	15.04	33.7	1.14487	1.14690	18.57
27.3	1.11423	1.11620	15.09	33.8	1.14536	1.14739	18.63
27.4	1.11470	1.11667	15.15	33.9	1.14585	1.14788	18.68
27.5	1.11517	1.11714	15.20	34.0	1.14634	1.14837	18.73
27.6	1.11564	1.11761	15.26	34.1	1.14684	1.14886	18.79
27.7	1.11610	1.11808	15.31	34.2	1.14733	1.14936	18.84
27.8	1.11657	1.11855	15.37	34.3	1.14782	1.14985	18.90
27.9	1.11704	1.11902	15.42	34.4	1.14831	1.15034	18.95
28.0	1.11751	1.11949	15.48	34.5	1.14880	1.15084	19.00
28.1	1.11798	1.11996	15.53	34.6	1.14930	1.15133	19.06
28.2	1.11845	1.12043	15.59	34.7	1.14979	1.15183	19.11
28.3	1.11892	1.12090	15.64	34.8	1.15029	1.15232	19.17
28.4	1.11940	1.12138	15.69	34.9	1.15078	1.15282	19.22

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
35.0	1.15128	1.15331	19.28	41.5	1.18418	1.18627	22.77
35.1	1.15177	1.15381	19.33	41.6	1.18470	1.18679	22.82
35.2	1.15226	1.15430	19.38	41.7	1.18522	1.18731	22.88
35.3	1.15276	1.15480	19.44	41.8	1.18573	1.18783	22.93
35.4	1.15326	1.15530	19.49	41.9	1.18625	1.18835	22.98
35.5	1.15375	1.15579	19.55	42.0	1.18677	1.18887	23.04
35.6	1.15425	1.15629	19.60	42.1	1.18729	1.18939	23.09
35.7	1.15475	1.15679	19.65	42.2	1.18781	1.18992	23.14
35.8	1.15524	1.15729	19.71	42.3	1.18834	1.19044	23.20
35.9	1.15574	1.15778	19.76	42.4	1.18886	1.19096	23.25
36.0	1.15624	1.15828	19.81	42.5	1.18938	1.19148	23.30
36.1	1.15674	1.15878	19.87	42.6	1.18990	1.19201	23.36
36.2	1.15724	1.15928	19.92	42.7	1.19042	1.19253	23.41
36.3	1.15773	1.15978	19.98	42.8	1.19095	1.19305	23.46
36.4	1.15823	1.16028	20.03	42.9	1.19147	1.19358	23.52
36.5	1.15873	1.16078	20.08	43.0	1.19199	1.19410	23.57
36.6	1.15923	1.16128	20.14	43.1	1.19252	1.19463	23.62
36.7	1.15973	1.16178	20.19	43.2	1.19304	1.19515	23.68
36.8	1.16023	1.16228	20.25	43.3	1.19356	1.19568	23.73
36.9	1.16073	1.16279	20.30	43.4	1.19409	1.19620	23.78
37.0	1.16124	1.16329	20.35	43.5	1.19462	1.19673	23.84
37.1	1.16174	1.16379	20.41	43.6	1.19514	1.19726	23.89
37.2	1.16224	1.16430	20.46	43.7	1.19567	1.19778	23.94
37.3	1.16274	1.16480	20.52	43.8	1.19619	1.19831	24.00
37.4	1.16324	1.16530	20.57	43.9	1.19672	1.19884	24.05
37.5	1.16375	1.16581	20.62	44.0	1.19725	1.19936	24.10
37.6	1.16425	1.16631	20.68	44.1	1.19778	1.19989	24.16
37.7	1.16476	1.16682	20.73	44.2	1.19830	1.20042	24.21
37.8	1.16526	1.16732	20.78	44.3	1.19883	1.20095	24.26
37.9	1.16576	1.16783	20.84	44.4	1.19936	1.20148	24.32
38.0	1.16627	1.16833	20.89	44.5	1.19989	1.20201	24.37
38.1	1.16678	1.16884	20.94	44.6	1.20042	1.20254	24.42
38.2	1.16728	1.16934	21.00	44.7	1.20095	1.20307	24.48
38.3	1.16779	1.16985	21.05	44.8	1.20148	1.20360	24.53
38.4	1.16829	1.17036	21.11	44.9	1.20201	1.20414	24.58
38.5	1.16880	1.17087	21.16	45.0	1.20254	1.20467	24.63
38.6	1.16931	1.17138	21.21	45.1	1.20307	1.20520	24.69
38.7	1.16982	1.17188	21.27	45.2	1.20360	1.20573	24.74
38.8	1.17032	1.17239	21.32	45.3	1.20414	1.20627	24.79
38.9	1.17083	1.17290	21.38	45.4	1.20467	1.20680	24.85
39.0	1.17134	1.17341	21.43	45.5	1.20520	1.20733	24.90
39.1	1.17185	1.17392	21.48	45.6	1.20573	1.20787	24.95
39.2	1.17236	1.17443	21.54	45.7	1.20627	1.20840	25.01
39.3	1.17287	1.17494	21.59	45.8	1.20680	1.20894	25.06
39.4	1.17338	1.17545	21.64	45.9	1.20734	1.20947	25.11
39.5	1.17389	1.17596	21.70	46.0	1.20787	1.21001	25.17
39.6	1.17440	1.17648	21.75	46.1	1.20840	1.21054	25.22
39.7	1.17491	1.17699	21.80	46.2	1.20894	1.21108	25.27
39.8	1.17542	1.17750	21.86	46.3	1.20948	1.21162	25.32
39.9	1.17594	1.17802	21.91	46.4	1.21001	1.21215	25.38
40.0	1.17645	1.17853	21.97	46.5	1.21055	1.21269	25.43
40.1	1.17696	1.17904	22.02	46.6	1.21109	1.21323	25.48
40.2	1.17747	1.17956	22.07	46.7	1.21162	1.21377	25.54
40.3	1.17799	1.18007	22.13	46.8	1.21216	1.21431	25.59
40.4	1.17850	1.18058	22.18	46.9	1.21270	1.21484	25.64
40.5	1.17901	1.18110	22.23	47.0	1.21324	1.21538	25.70
40.6	1.17953	1.18162	22.29	47.1	1.21378	1.21592	25.75
40.7	1.18004	1.18213	22.34	47.2	1.21432	1.21646	25.80
40.8	1.18056	1.18265	22.39	47.3	1.21486	1.21700	25.86
40.9	1.18108	1.18316	22.45	47.4	1.21540	1.21755	25.91
41.0	1.18159	1.18368	22.50	47.5	1.21594	1.21809	25.96
41.1	1.18211	1.18420	22.55	47.6	1.21648	1.21863	26.01
41.2	1.18262	1.18472	22.61	47.7	1.21702	1.21917	26.07
41.3	1.18314	1.18524	22.66	47.8	1.21756	1.21971	26.12
41.4	1.18366	1.18575	22.72	47.9	1.21810	1.22026	26.17

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
48.0	1.21864	1.22080	26.23	54.5	1.25470	1.25692	29.64
48.1	1.21918	1.22134	26.28	54.6	1.25526	1.25748	29.69
48.2	1.21973	1.22189	26.33	54.7	1.25583	1.25805	29.74
48.3	1.22027	1.22243	26.38	54.8	1.25640	1.25862	29.80
48.4	1.22082	1.22298	26.44	54.9	1.25697	1.25919	29.85
48.5	1.22136	1.22352	26.49	55.0	1.25754	1.25976	29.90
48.6	1.22190	1.22406	26.54	55.1	1.25810	1.26033	29.95
48.7	1.22245	1.22461	26.59	55.2	1.25867	1.26090	30.00
48.8	1.22300	1.22516	26.65	55.3	1.25924	1.26147	30.06
48.9	1.22354	1.22570	26.70	55.4	1.25982	1.26204	30.11
49.0	1.22409	1.22625	26.75	55.5	1.26039	1.26261	30.16
49.1	1.22463	1.22680	26.81	55.6	1.26096	1.26319	30.21
49.2	1.22518	1.22735	26.86	55.7	1.26153	1.26376	30.26
49.3	1.22573	1.22789	26.91	55.8	1.26210	1.26433	30.32
49.4	1.22627	1.22844	26.96	55.9	1.26267	1.26490	30.37
49.5	1.22682	1.22899	27.02	56.0	1.26324	1.26548	30.42
49.6	1.22737	1.22954	27.07	56.1	1.26382	1.26605	30.47
49.7	1.22792	1.23009	27.12	56.2	1.26439	1.26663	30.52
49.8	1.22847	1.23064	27.18	56.3	1.26496	1.26720	30.57
49.9	1.22902	1.23119	27.23	56.4	1.26554	1.26778	30.63
50.0	1.22957	1.23174	27.28	56.5	1.26611	1.26835	30.68
50.1	1.23012	1.23229	27.33	56.6	1.26669	1.26893	30.73
50.2	1.23067	1.23284	27.39	56.7	1.26726	1.26950	30.78
50.3	1.23122	1.23340	27.44	56.8	1.26784	1.27008	30.83
50.4	1.23177	1.23395	27.49	56.9	1.26841	1.27066	30.89
50.5	1.23232	1.23450	27.54	57.0	1.26899	1.27123	30.94
50.6	1.23287	1.23506	27.60	57.1	1.26956	1.27181	30.99
50.7	1.23343	1.23561	27.65	57.2	1.27014	1.27239	31.04
50.8	1.23398	1.23616	27.70	57.3	1.27072	1.27297	31.09
50.9	1.23453	1.23672	27.75	57.4	1.27130	1.27355	31.15
51.0	1.23508	1.23727	27.81	57.5	1.27188	1.27413	31.20
51.1	1.23564	1.23782	27.86	57.6	1.27246	1.27471	31.25
51.2	1.23619	1.23838	27.91	57.7	1.27304	1.27529	31.30
51.3	1.23675	1.23894	27.96	57.8	1.27361	1.27587	31.35
51.4	1.23730	1.23949	28.02	57.9	1.27419	1.27645	31.40
51.5	1.23786	1.24005	28.07	58.0	1.27477	1.27703	31.46
51.6	1.23841	1.24060	28.12	58.1	1.27535	1.27761	31.51
51.7	1.23897	1.24116	28.17	58.2	1.27594	1.27819	31.56
51.8	1.23953	1.24172	28.23	58.3	1.27652	1.27878	31.61
51.9	1.24008	1.24228	28.28	58.4	1.27710	1.27936	31.66
52.0	1.24064	1.24284	28.33	58.5	1.27768	1.27994	31.71
52.1	1.24120	1.24339	28.38	58.6	1.27826	1.28052	31.76
52.2	1.24176	1.24395	28.44	58.7	1.27884	1.28111	31.82
52.3	1.24232	1.24451	28.49	58.8	1.27943	1.28169	31.87
52.4	1.24287	1.24507	28.54	58.9	1.28001	1.28228	31.92
52.5	1.24343	1.24563	28.59	59.0	1.28060	1.28286	31.97
52.6	1.24399	1.24619	28.65	59.1	1.28118	1.28345	32.02
52.7	1.24455	1.24675	28.70	59.2	1.28176	1.28404	32.07
52.8	1.24511	1.24731	28.75	59.3	1.28235	1.28462	32.13
52.9	1.24567	1.24788	28.80	59.4	1.28294	1.28520	32.18
53.0	1.24623	1.24844	28.86	59.5	1.28352	1.28579	32.23
53.1	1.24680	1.24900	28.91	59.6	1.28411	1.28638	32.28
53.2	1.24736	1.24956	28.96	59.7	1.28469	1.28697	32.33
53.3	1.24792	1.25013	29.01	59.8	1.28528	1.28755	32.38
53.4	1.24848	1.25069	29.06	59.9	1.28587	1.28814	32.43
53.5	1.24905	1.25126	29.12	60.0	1.28646	1.28873	32.49
53.6	1.24961	1.25182	29.17	60.1	1.28704	1.28932	32.54
53.7	1.25017	1.25238	29.22	60.2	1.28763	1.28991	32.59
53.8	1.25074	1.25295	29.27	60.3	1.28822	1.29050	32.64
53.9	1.25130	1.25351	29.32	60.4	1.28881	1.29109	32.69
54.0	1.25187	1.25408	29.38	60.5	1.28940	1.29168	32.74
54.1	1.25243	1.25465	29.43	60.6	1.28999	1.29227	32.79
54.2	1.25300	1.25521	29.48	60.7	1.29058	1.29286	32.85
54.3	1.25356	1.25578	29.53	60.8	1.29117	1.29346	32.90
54.4	1.25413	1.25635	29.59	60.9	1.29176	1.29405	32.95

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
61.0	1.29235	1.29464	33.00	67.5	1.33163	1.33399	36.30
61.1	1.29295	1.29523	33.05	67.6	1.33225	1.33460	36.35
61.2	1.29354	1.29583	33.10	67.7	1.33287	1.33523	36.40
61.3	1.29413	1.29642	33.15	67.8	1.33348	1.33584	36.45
61.4	1.29472	1.29701	33.20	67.9	1.33410	1.33646	36.50
61.5	1.29532	1.29761	33.26	68.0	1.33472	1.33708	36.55
61.6	1.29591	1.29820	33.31	68.1	1.33534	1.33770	36.61
61.7	1.29651	1.29880	33.36	68.2	1.33596	1.33832	36.66
61.8	1.29710	1.29940	33.41	68.3	1.33658	1.33894	36.71
61.9	1.29770	1.29999	33.46	68.4	1.33720	1.33957	36.76
62.0	1.29829	1.30059	33.51	68.5	1.33782	1.34019	36.81
62.1	1.29889	1.30118	33.56	68.6	1.33844	1.34081	36.86
62.2	1.29948	1.30178	33.61	68.7	1.33906	1.34143	36.91
62.3	1.30008	1.30238	33.67	68.8	1.33968	1.34205	36.96
62.4	1.30068	1.30298	33.72	68.9	1.34031	1.34268	37.01
62.5	1.30127	1.30358	33.77	69.0	1.34093	1.34330	37.06
62.6	1.30187	1.30418	33.82	69.1	1.34155	1.34392	37.11
62.7	1.30247	1.30477	33.87	69.2	1.34217	1.34455	37.16
62.8	1.30307	1.30537	33.92	69.3	1.34280	1.34517	37.21
62.9	1.30367	1.30597	33.97	69.4	1.34342	1.34580	37.26
63.0	1.30427	1.30657	34.02	69.5	1.34405	1.34642	37.31
63.1	1.30487	1.30718	34.07	69.6	1.34467	1.34705	37.36
63.2	1.30547	1.30778	34.12	69.7	1.34530	1.34768	37.41
63.3	1.30607	1.30838	34.18	69.8	1.34592	1.34830	37.46
63.4	1.30667	1.30898	34.23	69.9	1.34655	1.34893	37.51
63.5	1.30727	1.30958	34.28	70.0	1.34717	1.34956	37.56
63.6	1.30787	1.31019	34.33	70.1	1.34780	1.35019	37.61
63.7	1.30848	1.31079	34.38	70.2	1.34843	1.35081	37.66
63.8	1.30908	1.31139	34.43	70.3	1.34906	1.35144	37.71
63.9	1.30968	1.31200	34.48	70.4	1.34968	1.35207	37.76
64.0	1.31028	1.31260	34.53	70.5	1.35031	1.35270	37.81
64.1	1.31088	1.31320	34.58	70.6	1.35094	1.35333	37.86
64.2	1.31149	1.31381	34.63	70.7	1.35157	1.35396	37.91
64.3	1.31209	1.31441	34.68	70.8	1.35220	1.35459	37.96
64.4	1.31270	1.31502	34.74	70.9	1.35283	1.35522	38.01
64.5	1.31330	1.31563	34.79	71.0	1.35346	1.35585	38.06
64.6	1.31391	1.31623	34.84	71.1	1.35409	1.35648	38.11
64.7	1.31452	1.31684	34.89	71.2	1.35472	1.35711	38.16
64.8	1.31512	1.31745	34.94	71.3	1.35535	1.35775	38.21
64.9	1.31573	1.31806	34.99	71.4	1.35598	1.35838	38.26
65.0	1.31633	1.31866	35.04	71.5	1.35661	1.35901	38.30
65.1	1.31694	1.31927	35.09	71.6	1.35724	1.35964	38.35
65.2	1.31755	1.31988	35.14	71.7	1.35788	1.36028	38.40
65.3	1.31816	1.32049	35.19	71.8	1.35851	1.36091	38.45
65.4	1.31877	1.32110	35.24	71.9	1.35914	1.36155	38.50
65.5	1.31937	1.32171	35.29	72.0	1.35978	1.36218	38.55
65.6	1.31998	1.32232	35.34	72.1	1.36041	1.36282	38.60
65.7	1.32059	1.32293	35.39	72.2	1.36105	1.36346	38.65
65.8	1.32120	1.32354	35.45	72.3	1.36168	1.36409	38.70
65.9	1.32181	1.32415	35.50	72.4	1.36232	1.36473	38.75
66.0	1.32242	1.32476	35.55	72.5	1.36295	1.36536	38.80
66.1	1.32304	1.32538	35.60	72.6	1.36359	1.36600	38.85
66.2	1.32365	1.32599	35.65	72.7	1.36423	1.36664	38.90
66.3	1.32426	1.32660	35.70	72.8	1.36486	1.36728	38.95
66.4	1.32487	1.32722	35.75	72.9	1.36550	1.36792	39.00
66.5	1.32548	1.32783	35.80	73.0	1.36614	1.36856	39.05
66.6	1.32610	1.32844	35.85	73.1	1.36678	1.36919	39.10
66.7	1.32671	1.32906	35.90	73.2	1.36742	1.36983	39.15
66.8	1.32732	1.32967	35.95	73.3	1.36805	1.37047	39.20
66.9	1.32794	1.33029	36.00	73.4	1.36869	1.37111	39.25
67.0	1.32855	1.33090	36.05	73.5	1.36933	1.37176	39.30
67.1	1.32917	1.33152	36.10	73.6	1.36997	1.37240	39.35
67.2	1.32978	1.33214	36.15	73.7	1.37061	1.37304	39.39
67.3	1.33040	1.33275	36.20	73.8	1.37125	1.37368	39.44
67.4	1.33102	1.33337	36.25	73.9	1.37189	1.37432	39.49

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
74.0	1.37254	1.37496	39.54	80.5	1.41504	1.41754	42.71
74.1	1.37318	1.37561	39.59	80.6	1.41571	1.41821	42.76
74.2	1.37382	1.37625	39.64	80.7	1.41637	1.41888	42.81
74.3	1.37446	1.37689	39.69	80.8	1.41704	1.41955	42.85
74.4	1.37510	1.37754	39.74	80.9	1.41771	1.42022	42.90
74.5	1.37575	1.37818	39.79	81.0	1.41837	1.42088	42.95
74.6	1.37639	1.37883	39.84	81.1	1.41904	1.42155	43.00
74.7	1.37704	1.37947	39.89	81.2	1.41971	1.42222	43.05
74.8	1.37768	1.38012	39.94	81.3	1.42038	1.42289	43.10
74.9	1.37833	1.38076	39.99	81.4	1.42105	1.42356	43.14
75.0	1.37897	1.38141	40.03	81.5	1.42172	1.42423	43.19
75.1	1.37962	1.38206	40.08	81.6	1.42239	1.42490	43.24
75.2	1.38026	1.38270	40.13	81.7	1.42306	1.42558	43.29
75.3	1.38091	1.38335	40.18	81.8	1.42373	1.42625	43.33
75.4	1.38156	1.38400	40.23	81.9	1.42440	1.42692	43.38
75.5	1.38220	1.38465	40.28	82.0	1.42507	1.42759	43.43
75.6	1.38285	1.38530	40.33	82.1	1.42574	1.42827	43.48
75.7	1.38350	1.38595	40.38	82.2	1.42642	1.42894	43.53
75.8	1.38415	1.38660	40.43	82.3	1.42709	1.42961	43.57
75.9	1.38480	1.38725	40.48	82.4	1.42776	1.43029	43.62
76.0	1.38545	1.38790	40.53	82.5	1.42844	1.43096	43.67
76.1	1.38610	1.38855	40.57	82.6	1.42911	1.43164	43.72
76.2	1.38675	1.38920	40.62	82.7	1.42978	1.43231	43.77
76.3	1.38740	1.38985	40.67	82.8	1.43046	1.43298	43.81
76.4	1.38805	1.39050	40.72	82.9	1.43113	1.43366	43.86
76.5	1.38870	1.39115	40.77	83.0	1.43181	1.43434	43.91
76.6	1.38935	1.39180	40.82	83.1	1.43248	1.43502	43.96
76.7	1.39000	1.39246	40.87	83.2	1.43316	1.43569	44.00
76.8	1.39065	1.39311	40.92	83.3	1.43384	1.43637	44.05
76.9	1.39130	1.39376	40.97	83.4	1.43451	1.43705	44.10
77.0	1.39196	1.39442	41.01	83.5	1.43519	1.43773	44.15
77.1	1.39261	1.39507	41.06	83.6	1.43587	1.43841	44.19
77.2	1.39326	1.39573	41.11	83.7	1.43654	1.43908	44.24
77.3	1.39392	1.39638	41.16	83.8	1.43722	1.43976	44.29
77.4	1.39457	1.39704	41.21	83.9	1.43790	1.44044	44.34
77.5	1.39523	1.39769	41.26	84.0	1.43858	1.44112	44.38
77.6	1.39588	1.39835	41.31	84.1	1.43926	1.44180	44.43
77.7	1.39654	1.39901	41.36	84.2	1.43994	1.44249	44.48
77.8	1.39719	1.39966	41.40	84.3	1.44062	1.44317	44.53
77.9	1.39785	1.40032	41.45	84.4	1.44130	1.44385	44.57
78.0	1.39850	1.40098	41.50	84.5	1.44198	1.44453	44.62
78.1	1.39916	1.40164	41.55	84.6	1.44266	1.44521	44.67
78.2	1.39982	1.40230	41.60	84.7	1.44334	1.44590	44.72
78.3	1.40048	1.40295	41.65	84.8	1.44402	1.44658	44.76
78.4	1.40113	1.40361	41.70	84.9	1.44470	1.44726	44.81
78.5	1.40179	1.40427	41.74	85.0	1.44539	1.44794	44.86
78.6	1.40245	1.40493	41.79	85.1	1.44607	1.44863	44.91
78.7	1.40311	1.40559	41.84	85.2	1.44675	1.44931	44.95
78.8	1.40377	1.40625	41.89	85.3	1.44744	1.45000	45.00
78.9	1.40443	1.40691	41.94	85.4	1.44812	1.45068	45.05
79.0	1.40509	1.40758	41.99	85.5	1.44881	1.45137	45.09
79.1	1.40575	1.40824	42.03	85.6	1.44949	1.45205	45.14
79.2	1.40641	1.40890	42.08	85.7	1.45018	1.45274	45.19
79.3	1.40707	1.40956	42.13	85.8	1.45086	1.45343	45.24
79.4	1.40774	1.41023	42.18	85.9	1.45154	1.45411	45.28
79.5	1.40840	1.41089	42.23	86.0	1.45223	1.45480	45.33
79.6	1.40906	1.41155	42.28	86.1	1.45292	1.45549	45.38
79.7	1.40972	1.41222	42.32	86.2	1.45360	1.45618	45.42
79.8	1.41039	1.41288	42.37	86.3	1.45429	1.45686	45.47
79.9	1.41105	1.41355	42.42	86.4	1.45498	1.45755	45.52
80.0	1.41172	1.41421	42.47	86.5	1.45567	1.45824	45.57
80.1	1.41238	1.41488	42.52	86.6	1.45636	1.45893	45.61
80.2	1.41304	1.41554	42.57	86.7	1.45704	1.45962	45.66
80.3	1.41371	1.41621	42.61	86.8	1.45773	1.46031	45.71
80.4	1.41437	1.41688	42.66	86.9	1.45842	1.46100	45.75

TABLE 2—Continued

Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)	Degrees Brix or per cent sucrose by weight	Specific gravity at 20°/4° C	Specific gravity at 20°/20° C	Degrees Baumé (modulus 145)
87.0	1.45911	1.46170	45.80	93.5	1.50472	1.50738	48.81
87.1	1.45980	1.46239	45.85	93.6	1.50543	1.50810	48.85
87.2	1.46050	1.46308	45.89	93.7	1.50615	1.50881	48.90
87.3	1.46119	1.46377	45.94	93.8	1.50686	1.50952	48.94
87.4	1.46188	1.46446	45.99	93.9	1.50757	1.51024	48.99
87.5	1.46257	1.46516	46.03	94.0	1.50829	1.51096	49.03
87.6	1.46326	1.46585	46.08	94.1	1.50900	1.51167	49.08
87.7	1.46395	1.46654	46.13	94.2	1.50972	1.51239	49.12
87.8	1.46464	1.46724	46.17	94.3	1.51044	1.51311	49.17
87.9	1.46534	1.46793	46.22	94.4	1.51115	1.51382	49.22
88.0	1.46603	1.46862	46.27	94.5	1.51187	1.51454	49.26
88.1	1.46673	1.46932	46.31	94.6	1.51258	1.51526	49.31
88.2	1.46742	1.47002	46.36	94.7	1.51330	1.51598	49.35
88.3	1.46812	1.47071	46.41	94.8	1.51402	1.51670	49.40
88.4	1.46881	1.47141	46.45	94.9	1.51474	1.51742	49.44
88.5	1.46950	1.47210	46.50	95.0	1.51546	1.51814	49.49
88.6	1.47020	1.47280	46.55	95.1	1.51617	1.51886	49.53
88.7	1.47090	1.47350	46.59	95.2	1.51689	1.51958	49.58
88.8	1.47159	1.47420	46.64	95.3	1.51761	1.52030	49.62
88.9	1.47229	1.47489	46.69	95.4	1.51833	1.52102	49.67
89.0	1.47299	1.47559	46.73	95.5	1.51905	1.52174	49.71
89.1	1.47368	1.47629	46.78	95.6	1.51977	1.52246	49.76
89.2	1.47438	1.47699	46.83	95.7	1.52049	1.52318	49.80
89.3	1.47508	1.47769	46.87	95.8	1.52121	1.52390	49.85
89.4	1.47578	1.47839	46.92	95.9	1.52193	1.52463	49.90
89.5	1.47648	1.47909	46.97	96.0	1.52266	1.52535	49.94
89.6	1.47718	1.47979	47.01	96.1	1.52338	1.52607	49.98
89.7	1.47788	1.48049	47.06	96.2	1.52410	1.52680	50.03
89.8	1.47858	1.48119	47.11	96.3	1.52482	1.52752	50.08
89.9	1.47928	1.48189	47.15	96.4	1.52555	1.52824	50.12
90.0	1.47998	1.48259	47.20	96.5	1.52627	1.52897	50.16
90.1	1.48068	1.48330	47.24	96.6	1.52699	1.52969	50.21
90.2	1.48138	1.48400	47.29	96.7	1.52772	1.53042	50.25
90.3	1.48208	1.48470	47.34	96.8	1.52844	1.53114	50.30
90.4	1.48278	1.48540	47.38	96.9	1.52917	1.53187	50.34
90.5	1.48348	1.48611	47.43	97.0	1.52989	1.53260	50.39
90.6	1.48419	1.48681	47.48	97.1	1.53062	1.53332	50.43
90.7	1.48489	1.48752	47.52	97.2	1.53134	1.53405	50.48
90.8	1.48559	1.48822	47.57	97.3	1.53207	1.53478	50.52
90.9	1.48630	1.48893	47.61	97.4	1.53279	1.53551	50.57
91.0	1.48700	1.48963	47.66	97.5	1.53352	1.53623	50.61
91.1	1.48771	1.49034	47.71	97.6	1.53425	1.53696	50.66
91.2	1.48841	1.49104	47.75	97.7	1.53498	1.53769	50.70
91.3	1.48912	1.49175	47.80	97.8	1.53570	1.53842	50.75
91.4	1.48982	1.49246	47.84	97.9	1.53643	1.53915	50.79
91.5	1.49053	1.49316	47.89	98.0	1.53716	1.53988	50.84
91.6	1.49123	1.49387	47.94	98.1	1.53789	1.54061	50.88
91.7	1.49194	1.49458	47.98	98.2	1.53862	1.54134	50.93
91.8	1.49265	1.49529	48.03	98.3	1.53935	1.54207	50.97
91.9	1.49336	1.49600	48.08	98.4	1.54008	1.54280	51.02
92.0	1.49406	1.49671	48.12	98.5	1.54081	1.54353	51.06
92.1	1.49477	1.49741	48.17	98.6	1.54154	1.54426	51.10
92.2	1.49548	1.49812	48.21	98.7	1.54227	1.54499	51.15
92.3	1.49619	1.49883	48.26	98.8	1.54300	1.54573	51.19
92.4	1.49690	1.49954	48.30	98.9	1.54373	1.54646	51.24
92.5	1.49761	1.50026	48.35	99.0	1.54446	1.54719	51.28
92.6	1.49832	1.50097	48.40	99.1	1.54519	1.54793	51.33
92.7	1.49903	1.50168	48.44	99.2	1.54593	1.54866	51.37
92.8	1.49974	1.50239	48.49	99.3	1.54666	1.54939	51.42
92.9	1.50045	1.50310	48.53	99.4	1.54739	1.55013	51.46
93.0	1.50116	1.50381	48.58	99.5	1.54813	1.55087	51.50
93.1	1.50187	1.50453	48.62	99.6	1.54886	1.55160	51.55
93.2	1.50258	1.50524	48.67	99.7	1.54960	1.55234	51.59
93.3	1.50329	1.50595	48.72	99.8	1.55033	1.55307	51.64
93.4	1.50401	1.50667	48.76	99.9	1.55106	1.55381	51.68
				100.0	1.55180	1.55454	51.73

